DOCUMENT RESUME

ED 075 196 SE 015 807

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TITLE Relationships Between Cognitive Style and Instructional Treatment Among Prospective Elementary School Teachers.
PUB DATE Feb 73
NOTE 5p.; Paper presented at Annual Meeting of American Educational Research Association (New Orleans, Louisiana, February 25-March 1, 1973)

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Division; *Elementary School Mathematics; *Instruction; Learning; Learning Theories; Mathematics Education; Preservice Education; *Research; Student Characteristics; *Teacher Education

ABSTRACT

The purpose was to determine if there existed an interaction of cognitive style with teaching method on achievement and retention of strategies acquired through two differential treatments. Forty-eight elementary education majors received instruction on the topics "Teaching Division of Rational Numbers in the Elementary School" in one of two ways: (1) as a participant in a teacher demonstration presentation or (2) through the use of a written self-paced learning module. The Hidden Figures Test (HFT) was used to provide measurement of the cognitive style of flexibility of closure; an achievement test was administered following the treatments and an alternate form administered at the end of the semester to measure retention. Results showed no differences between treatment groups on achievement or retention and no significant interaction between flexibility of closure and treatment. However, there was a higher correlation between HFT scores for the module group as compared to the teacher demonstration group on both achievement and retention. (DT)

RELATIONSHIPS BETWEEN COGNITIVE STYLE AND INSTRUCTIONAL TREATMENT AMONG PROSPECTIVE ELEMENTARY SCHOOL TEACHERS

Gerald Eugene Smith

INTRODUCTION

One current transformation in the design of teacher education as been an attempt to develop modular programs in various content and process areas (Clark, 3). Characteristics of the instructional features frequently observed in this approach include explicitly stated objectives, self-paced format, short instructional tasks, and immediate feedback for required student responses. In essence, this has been an attempt to individualize instruction through a programmed approach.

Cognitive styles are learner characteristics which may play an important part in the prescription of instruction. The term cognitive style has been attached to various idiosyncratic factors in the performance of cognitive tasks.

Flexibility of closure refers to one dimension of cognitive style which may be considered a reflection of the ability to distinguish and analyze an item embedded within a stimulus complex. This definition of flexibility of closure is consistent with that of Witkin (7). An operational index of flexibility of closure is performance on the Hidden Figures Test (French et al., 1963), which requires that the student identify a simple figure embedded within a more complex figure.

It has been suggested by Carter (2) that, for some children, learners low on measures of flexibility of closure require instruction that is highly

task specific. Self-paced modules, as used among pre-service teachers, are by design generally more task specific than various teacher-centered modes of instruction. It was hypothesized, then, that there would exist an interaction of cognitive style with teaching method on achievement and retention of strategies acquired through the use of two differential treatments.

METHOD

The Hidden Figures Test (HFT) was employed to provide measures of the cognitive style of flexibility of closure. The teaching strategies selected for this study were identified with five specific objectives related to the topic, "Teaching Division of Rational Numbers in the Elementary School."

The study was conducted using a sample of 48 undergraduate elementary education majors. The subjects were enrolled in classes of the course, Teaching Mathematics in Elementary Schools, at The University of Texas at Austin, Fall Semester, 1971. As part of the course, they received instruction on the selected topic in one of two ways: (1) as a participant in a teacher demonstration presentation, or (2) through the use of a written self-paced learning module.

An achievement test designed to measure competence of the instructional objectives was administered to all subjects following the treatments. An alternate form of the achievement test was administered at the end of the semester as a measure of retention.

RESULTS

Results showed no differences between treatment groups on achievement or retention. Analysis of covariance revealed no significant interaction between flexibility of closure and treatment method. The results indicated, however, a higher correlation between HFT scores for the Module group as compared to the Teacher Demonstration group on both achievement (Module = .86, Teacher Demonstration = .62; $p < .01$) and retention (Module = .88, Teacher Demonstration = .56; $p < .01$).

DISCUSSION

These results suggest that the cognitive style of flexibility of closure is not useful as a predictor of achievement or retention when considering assignments to the specific instructional treatments employed in this study. That the two instructional treatments were equally effective in producing achievement and retention implies that a modular approach to preservice teacher education is at least a viable alternative to conventional methods for the instructional topic considered in the investigation.

The results do not corroborate the findings by Koran (5) of significant interactions between flexibility of closure and instructional treatments, and are not in agreement with the implications drawn from findings by Carter (1) and Coop (4).

The implication from Carter's study is that students with low closure flexibility would achieve higher when provided instruction that is highly task specific. It may be that it is not possible to extend the generalization

from Carter's findings to undergraduate college students. Also the assumption made that a module is more task specific than a teacher demonstration mode of instruction may not be valid.

It does appear, however, that this learner characteristic is relevant when working with individuals in instructional settings, and extensions of this research should be pursued.

REFERENCES

1. Carter, Heather L. A study of the ability of primary school children to generalize behavioral competencies acquired in science to other content settings. Unpublished doctoral dissertation. College Park, Maryland, 1969.

2. Carter, Heather L. Different ways to think in mathematics. Paper presented at the Conference for the Advancement of Science and Mathematics Teaching, Austin, Texas, 1969.

3. Clark, Michael C. A systematic approach to module development, Report Series No. 37, The Research and Development Center for Teacher Education, Austin, Texas, 1971.

4. Coop, Richard H., and Brown, Laurence D. Effects of cognitive style and teaching method on categories of achievement, Experimental Publication System, Issue No. 7, Ms. No. 238-4, August, 1970.

5. Kagan, M. L. The effect of individual differences on observational learning in the acquisition of a teaching skill. Unpublished doctoral dissertation Stanford University, 1969.

6. Smith, Gerald E. The relationship of cognitive style and instructional treatments in the acquisition of strategies for teaching elementary [illegible]. Unpublished doctoral dissertation. Austin, Texas, 1972.

7. W[illegible] A. Individual differences in ease of perception of concealed figures. Journal of Personality, 1950, 19, 1-16.